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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,385	01/28/2004	Liya Wang	TJT-13902/16	3351

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EXAMINER	
CANTELMO, GREGG	
ART UNIT	**PAPER NUMBER**
1745	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/13/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary	Application No.	Applicant(s)	
	10/766,385	WANG ET AL.	
	Examiner	Art Unit	
	Gregg Cantelmo	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) *20-32* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☒ Claim(s) *6,8 and 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *1/28/04* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *SEE OFFICE ACTION*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Election/Restriction

1. In response to the election received January 4, 2007:

a. Applicant's election without traverse of Group I, claims 1-19 in the reply filed on January 4, 2007 is acknowledged. Furthermore applicant's election of species has been acknowledged. Applicant elected a species comprised of a first component which is a lithiated metal phosphate and a second component which is an oxynitride of a metal. Applicant further elected the species in which a dopant is included,

b. Claims 20-32 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on January 4, 2007.

Priority

2. Applicants claim to U.S. Provisional Application Serial No. 60/443,663 is acknowledged.

Information Disclosure Statement

3. The information disclosure statements filed May 4, 2004 and September 17, 2004 have been placed in the application file and the information referred to therein has been considered as to the merits.

Drawings

4. The drawings received January 28, 2004 are acceptable for examination purposes.

Specification

5. The disclosure is objected to because of the following informalities: the formula at page 8, line 16 recites "ZR" such elemental symbols are not known. Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for particular composites, does not reasonably provide enablement for all composite materials recited in claims 1-19. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. The claims broadly recite a first component as a metal phosphate and a second component from the group consisting of metal nitrides, metal oxynitrides and combinations thereof is not fully supported by the description. The description does not disclose the claimed invention in a manner sufficiently clear and complete for the claimed invention to be carried out by a person skilled in the art because: while the claims have enablement for particular disclosed materials there is a sufficiently strong lack of enablement in the written description for claiming all metal phosphates and all metal nitrides, metal

oxynitrides and combinations thereof. Therefore one of ordinary skill in the art would not have had sufficient understanding of the metal phosphates and all metal nitrides, metal oxynitrides and combinations thereof which were appreciated by the claimed invention at the time the invention was made and would require serious burden with undue experimentation to determine which materials the claims are in fact entitled to.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 3-5, 12 and 14-16 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,817,436 (Nishijima).

Nishijima discloses a composite material comprising nickel phosphate and lithium nitride (paragraph bridging columns 8 and 9 as applied to claims 1, 5, 12 and 16). Since the composite is a mixture of both materials, for at least some portions of the mixture, the two compositions will be disposed adjacent to one another such that they can be considered to be in a relative core and surface coating relationship (as applied to claims 3 and 14). Also since the composite is a mixture of both materials, for at least some portions of the mixture, the two compositions will have inherent regions which have more of one component relative to the other and thus would exemplify a composition wherein one component is a minor component disposed in the bulk alternate component (as applied to claims 4 and 15).

9. Claims 1-4, 12, 13 and 12-15 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,132,905 (Kumar).

Kumar discloses a composite material comprising lithium nitride and lithium phosphate (Example 2 and table I as applied to claims 1, 2, 12 and 13). With respect to the term electrode in claims 12, 13 and 15, the claim does not provide sufficient limitations to differentiate the material of claim 12 from the electrolyte material of Kumar. Thus the composition of Kumar is held to read on the composition of claims 12 and 13. Since the composite is a mixture of both materials, for at least some portions of the mixture, the two compositions will be disposed adjacent to one another such that they can be considered to be in a relative core and surface coating relationship (as applied to claims 3 and 14). Also since the composite is a mixture of both materials, for at least some portions of the mixture, the two compositions will have inherent regions which have more of one component relative to the other and thus would exemplify a composition wherein one component is a minor component disposed in the bulk alternate component (as applied to claims 4 and 15).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 7 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishijima in view of U.S. patent No. 5,910,832 (Goodenough).

The teachings of Nishijima have been discussed above and are incorporated herein.

Nishijima does not disclose the structure being either olivine or nasicon.

Goodenough discloses that it is desired to use olivine or NASICON structures for lithium battery electrodes (abstract). Such structures provide electrode materials having larger tetrahedral polyanions which form 3D framework host structures with octahedral-

site transition metal oxide cations (col. 8, ll. 49-57). The structure provides for electrodes having higher energy densities.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Nishijima by selecting the structure of the electrodes of Nishijima to be either olivine or NASICON since it would have provided electrode materials having larger tetrahedral polyanions which formed 3D framework host structures with octahedral-site transition metal oxide cations and provided for electrodes having higher energy densities.

11. Claims 9, 10 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishijima in view of U.S. patent No. 5,948,569 (Moses).

The teachings of Nishijima have been discussed above and are incorporated herein.

Nishijima does not disclose adding dopants to the composition.

Moses discloses that the positive electrode 14 can include, for example, LiNiO2, cobalt- or aluminum-doped LiNiO2 (col. 3, ll. 65-67 of Moses). The motivation for adding dopants to the electrodes is that it enhances the capacity properties of the material and battery.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Nishijima by adding metal dopants to the electrode since it would have enhanced the capacity properties of the battery.

12. Claims 9, 11 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishijima in view of U.S. patent No. 6,153,333 (Barker).

The teachings of Nishijima have been discussed above and are incorporated herein.

Nishijima does not disclose adding dopants to the composition.

Barker discloses including halogen additives in a composition comprising lithium phosphate (col. 2, ll. 33-50). The motivation for adding dopants to the electrodes is that it enhances the capacity properties of the material and battery.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Nishijima by adding dopants to the electrode since it would have enhanced the capacity properties of the battery.

Allowable Subject Matter

13. Claims 6, 8 and 17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter: none of the prior art of record appears to teach, suggest or render obvious the inventions of claims 6, 8 and 17.

With respect to claim 6: The metal phosphate is a transition metal phosphate selected from the group consisting of Fe, V Mn and combinations thereof. The metal phosphate in Nishijima is nickel and all embodiments therein require the combination of

lithium and nickel. Thus there is insufficient motivation to replace the nickel metal with Fe, V, Mn and combinations thereof (claim 6).

With respect to claims 8 and 17: The second component is a transition metal nitride, transition metal oxynitride, and combinations thereof. The second component in each of Nishijima and Kumar are lithium nitride and not a transition metal nitride, transition metal oxynitride, and combinations thereof. It would not have been obvious to replace the lithium component with a transition element since the presence of lithium is required in the end products of the prior art teachings (claims 8 and 17).

15. As to the elected species: Applicant elected a species comprised of a first component which is a lithiated metal phosphate and a second component which is an oxynitride of a metal. Applicant further elected the species in which a dopant is included. This particular species is not taught, suggested or obvious over the prior art of record.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Gregg Cantelmo
Primary Examiner
Art Unit 1745

gc
March 8,2007